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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/762,341	YUAN ET AL.	
	Examiner	Art Unit	
	Marivelisse Santiago-Cordero	2617	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-25* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-25* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *23 January 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claim 18 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 18 recites the limitation "each resolution reduction means" in lines 1-2. There is insufficient antecedent basis for this limitation in the claim. Note that the term "each" implies a plurality of resolution reduction means, which is not claimed in parent claim 15; thus, being contradictory and indefinite.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1-2 and 10-13 are rejected under 35 U.S.C. 102(e) as being anticipated by Ho et al. (hereinafter "Ho"; Pub. No.: US 2003/0193922).

Regarding claim 1, Ho discloses a cell search method for use in a mobile communication system, the method comprising the steps of:

performing one or more identification steps for identifying timing and codes of oversampled input signals (Abstract; Fig. 6, steps 630-650; paragraph [0048]); and

reducing resolution of the oversampled input signals before performing the one or more identification steps (Abstract; Fig. 6, reference 620; paragraph [0048]).

Regarding claim 2, Ho discloses the cell search method according to claim 1, wherein the step of reducing resolution of the oversampled input signals includes at least one of sample-combining and down-sampling the oversampled input signals (Fig. 6, reference 620).

Regarding claim 10, Ho discloses the cell search method according to claim 1, wherein the one or more identification steps include a slot timing identification step (Fig. 6, reference 630).

Regarding claim 11, Ho discloses the cell search method according to claim 1, wherein the one or more identification steps includes frame timing and code group identification step (Fig. 6, reference 640).

Regarding claim 12, Ho discloses the cell search method according to claim 1, wherein the one or more identification steps includes a scrambling code identification step (Fig. 6, reference 650).

Regarding claim 13, which recites an apparatus version of claim 1, see rationale as previously discussed above (see also Ho: paragraph [0069]).

5. Claims 1-4 and 10-18 are rejected under 35 U.S.C. 102(e) as being anticipated by Nassiri-Toussi et al. (hereinafter "Nassiri"; Pub. No.: US 2003/0193922).

Regarding claim 1, Nassiri discloses a cell search method for use in a mobile communication system, the method comprising the steps of:

performing one or more identification steps for identifying timing and codes of oversampled input signals (Fig. 2, references 222, 224, 226); and

reducing resolution of the oversampled input signals before performing the one or more identification steps (Fig. 3, reference 306, note the Finite Impulse Response (FIR) filter; col. 7, lines 9-22).

Regarding claim 2, Nassiri discloses the cell search method according to claim 1, wherein the step of reducing resolution of the oversampled input signals includes at least one of sample-combining and down-sampling the oversampled input signals (Fig. 3, reference 306; note the Finite Impulse Response (FIR) filter; col. 7, lines 9-22).

Regarding claim 3, Nassiri discloses the cell search method of claim 1, wherein the one or more identification steps produce an output in a form of reference timing output signals (Fig. 2, note the output of the three stages), the method further comprising the step of converting the reference timing output signals back to an un-reduced resolution when each identification step is complete (Figs. 4-5, reference 410 and 510; note, e.g., that when slot timing identification (in Fig. 3) is complete, its output is received as input of unit 410 (see Fig. 4), which in addition, receives the un-reduced streams of I and Q samples; thus, fairly characterized as converting them back to an un-reduced resolution. The same reasoning applies for reference 510 when frame boundary and group identification (Fig. 4) is complete).

Regarding claim 4, Nassiri discloses the cell search method according to claim 3, wherein the step of reducing resolution of the oversampled input signals includes at least one of sample-combining and down-sampling the oversampled input signals (Fig. 3, reference 306; note the Finite Impulse Response (FIR) filter; col. 7, lines 9-22).

Regarding claim 10, Nassiri discloses the cell search method according to claim 1, wherein the one or more identification steps include a slot timing identification step (Figs. 1 and 3, reference 222).

Regarding claim 11, Nassiri discloses the cell search method according to claim 1, wherein the one or more identification steps includes frame timing and code group identification step (Figs. 1 and 4, reference 224).

Regarding claim 12, Nassiri discloses the cell search method according to claim 1, wherein the one or more identification steps includes a scrambling code identification step (Figs. 1 and 5, reference 226).

Regarding claims 13-14, which recites an apparatus version of claims 1 and 3, see rationale as previously discussed above (see also Nassiri: col. 3, lines 57-60).

Regarding claim 15, Nassiri discloses wherein the identification means comprises: a slot timing identifier (Figs. 2 and 3, reference 222); a frame timing code and group number identifier (Figs. 2 and 4, reference 224); and a scrambling code identifier (Figs. 2 and 5, reference 226).

Regarding claim 16, Nassiri discloses wherein the resolution reduction means comprises at least one of sample-combiner and down-sampler for operation with each of the identifiers (Fig. 3, reference 306; note the Finite Impulse Response (FIR) filter; col. 7, lines 9-22).

Regarding claim 17, Nassiri discloses wherein the at least one of sample-combiner and down-sampler is operable at a different sub-sampling rate for each identifier (Fig. 3, note the "twice chip rate"; Figs. 4-5; note the "chip rate").

Regarding claim 18, Nassiri discloses wherein each resolution reduction means comprises at least one of sample-combiner and down-sampler (Fig. 2, reference 216; Fig. 3, reference 306; note the Finite Impulse Response (FIR) filter; col. 7, lines 9-22).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 5-9 and 19-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nassiri in view of Applicant's Admitted Prior Art (hereinafter "AAPA"; see Fig. 1 and Background of the Invention).

Regarding claim 5, Nassiri discloses the cell search method according to claim 3 (see above), the method further comprising the steps of:

in each identification step, correlating the reduced resolution input signal with a code (Figs. 3-5, references 314, 316, 420, 520);

calculating the correlated signal (Figs. 3-5, references 360, 460);

accumulating results (Figs. 3-5, references 340, 450, 580, 560);

storing the results (Figs. 3-5, references 330, 445); and

searching for a maximum accumulated result (Figs. 3-5, references 350, 470, 570).

Although Nassiri, based in I (in-phase) and Q (quadrature) components of the signal, discloses detection and comparison of peaks against a threshold fixed or varied according to measured power (col. 8, lines 4-15), Nassiri fails to specifically disclose calculating power of the

correlated signal, accumulating power results; storing the accumulated power results, and searching for a maximum accumulated power result.

However, in the same field of endeavor, AAPA discloses in each identification step, correlating the input signal with a code (Fig. 1, reference 703; page 2, lines 5-20);

calculating power of the correlated signal (Fig. 1, reference 705; page 2, lines 21-23);

accumulating power results (Fig. 1, reference 706; page 2, line 24 through page 3, line 3);

storing the accumulated power results (Fig. 1, reference 707; page 3, lines 4-5); and

searching for a maximum accumulated power result (Fig. 1, reference 708; page 3, lines 5-7).

Therefore, it would have been obvious to one of ordinary skill in this art at the time of invention by applicant to correlate, in each identification step, the reduced resolution input signal of Nassiri, with a code, calculating power of the correlated signal, accumulating power results, storing the accumulated power results, and searching for a maximum accumulated power result as suggested by AAPA for the advantages of complying with the 3GPP standard (page 2, lines 19-20), obtaining power of correlated signals based on I and Q components of the incoming signal, increasing reliability detection (page 3, lines 2-3), saving results (page 3, lines 4-5), and improving detection and synchronization functions.

Regarding claim 6, in the obvious combination, Nassiri discloses wherein the step of reducing resolution of the oversampled input signals includes at least one of sample-combining and down-sampling the oversampled input signals (Fig. 3, reference 306; note the Finite Impulse Response (FIR) filter; col. 7, lines 9-22).

Regarding claim 7, in the obvious combination, Nassiri discloses the method further comprising the step of comparing the maximum accumulated result with a threshold (Figs. 3-5, references 350, 470, 570; col. 8, lines 9-24). In addition, AAPA discloses the method further comprising the step of comparing the maximum accumulated power result with a threshold (Fig. 1, reference 709; page 3, lines 7-9).

Therefore, it would have been obvious to one of ordinary skill in this art at the time of invention by applicant to comparing the maximum accumulated power result with a threshold as suggested by AAPA for the advantages of identifying and generating the highest peak or slot boundary, and improving detection and synchronization functions.

Regarding claim 8, in the obvious combination, Nassiri discloses the method further comprising the step of converting the reference timing output signal back to an un-reduced resolution when the threshold is exceeded (Figs. 4-5, reference 410 and 510; col. 10, lines 17-25; note, e.g., that when slot timing identification (in Fig. 3) is complete, its output is received as input of unit 410 (see Fig. 4), which in addition, receives the un-reduced streams of I and Q samples; thus, fairly characterized as converting them back to an un-reduced resolution. The same reasoning applies for reference 510 when frame boundary and group identification (Fig. 4) is complete).

Regarding claim 9, in the obvious combination, Nassiri discloses wherein the step of reducing resolution of the oversampled input signals includes at least one of sample-combining and down-sampling the oversampled input signals (Fig. 3, reference 306; note the Finite Impulse Response (FIR) filter; col. 7, lines 9-22).

Regarding claim 19, Nassiri discloses the apparatus according to claim 15 (see above), wherein each identifier comprises: a matching filter or correlating unit for dispreading the oversampled input signals (Figs. 3-5, references 305, 420-430, 520; col. 9, lines 46-65), but fails to specifically disclose a code generator, a power profile creator; and a detector.

However, in the same field of endeavor, AAPA discloses an apparatus, wherein each identifier comprises: a matching filter or correlating unit for dispreading the oversampled input signals (Fig. 1, references 702, 704; page 2, lines 1-4); a code generator (Fig. 1, reference 703; page 2, lines 10-20), a power profile creator (Fig. 1, references 705-707; page 2, references 7-11); and a detector (Fig. 1, reference 708).

Therefore, it would have been obvious to one of ordinary skill in this art at the time of invention by applicant to incorporate in each identifier of the apparatus of Nassiri a matching filter or correlating unit for dispreading the oversampled input signals, a code generator, a power profile creator, and a detector as suggested by AAPA for the advantages of complying with 3GPP standards, identifying and generating the highest peaks or boundaries, and improving detection and synchronization functions.

Regarding claim 20, in the obvious combination, Nassiri discloses wherein the matching or correlating unit comprises a match filter (Figs. 3-4, reference 305, 430; col. 9, lines 55-65).

In addition, AAPA discloses wherein the matching or correlating unit comprises a match filter (Fig. 1, reference 704; page 2, lines 5-15). Therefore, it would have been obvious to one of ordinary skill in this art at the time of invention by applicant to incorporate a match filter in the matching or correlating unit of Nassiri as suggested by AAPA for the advantages of dispreading the received signal (AAPA: page 2, lines 1-10).

Regarding claim 21, in the obvious combination, AAPA discloses wherein the matching of correlating unit comprises a bank of correlators (page 2, lines 10-12). Therefore, it would have been obvious to one of ordinary skill in this art at the time of invention by applicant to incorporate a bank of correlators in the matching or correlating unit of Nassiri as suggested by AAPA for the advantages of performing the actual dispreading the received signal (AAPA: page 2, lines 10-12).

Regarding claim 22, in the obvious combination, AAPA discloses wherein the power profile creator comprises:

a power calculator for obtaining the power of a correlated signal (Fig. 1, reference 705);

an accumulator for accumulating current power results and previous result (Fig. 1, reference 706); and

a memory for storing the accumulated power results (Fig. 1, reference 707).

Therefore, it would have been obvious to one of ordinary skill in this art at the time of invention by applicant to incorporate in the power profile creator of the apparatus of Nassiri a power calculator for obtaining the power of a correlated signal, an accumulator for accumulating current power results and previous result, and a memory for storing the accumulated power results as suggested by AAPA for the advantages of complying with 3GPP standards, identifying, comparing, and generating the highest peaks or boundaries, and improving detection and synchronization functions.

Regarding claim 23, in the obvious combination, Nassiri discloses wherein the detector is arranged to search for a maximum value among the accumulated results (Fig. 3, reference 350; col. 8, lines 9-24).

In addition, AAPA discloses wherein the detector is arranged to search for a maximum value among the accumulated power results (page 3, lines 5-7). Therefore, it would have been obvious to one of ordinary skill in this art at the time of invention by applicant to arrange the detector of Nassiri to search for a maximum value among the accumulated power results as suggested by AAPA for the advantages of identifying a candidate peak (AAPA: page 3, lines 5-7), and/or the highest peak or boundary (Nassiri: col. 8, lines 9-24).

Regarding claim 24, in the obvious combination, Nassiri discloses wherein the detector comprises a decision unit for comparing the detected maximum against a threshold (Figs. 3-5, references 350, 470, and 570).

In addition, AAPA discloses wherein the detector comprises a decision unit for comparing the detected maximum against a threshold (page 3, lines 7-11). Therefore, it would have been obvious to one of ordinary skill in this art at the time of invention by applicant to incorporate in the detector of Nassiri a decision unit for comparing the detected maximum against a threshold as suggested by AAPA for the advantages of identifying a candidate peak (AAPA: page 3, lines 5-7), and/or the highest peak or boundary (Nassiri: col. 8, lines 9-24).

Regarding claim 25, in the obvious combination, Nassiri discloses wherein the conversion means is arranged to convert the reference timing output signal back to an un-reduced resolution when the threshold is exceeded (Figs. 4-5, reference 410 and 510; col. 10, lines 17-25; note, e.g., that when slot timing identification (in Fig. 3) is complete, its output is received as input of unit 410 (see Fig. 4), which in addition, receives the un-reduced streams of I and Q samples; thus, fairly characterized as converting them back to an un-reduced resolution. The

same reasoning applies for reference 510 when frame boundary and group identification (Fig. 4) is complete).

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Ho et al. (Pub. No.: US 2003/0182583 and Patent No.: 7,126,981) discloses method and apparatus for cell search for W-CDMA with non-ideal sampling and with effect of clock offset, respectively; and Ho et al. (Non-Patent Literature, see form PTO-892) discloses cell search for 3GPP W-CDMA/FDD with chip clock shift and non-ideal sampling.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Marivelisse Santiago-Cordero whose telephone number is (571) 272-7839. The examiner can normally be reached on Monday through Friday from 7:30am to 4:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, William Trost can be reached on (571) 272-7872. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

MSC 7/17/07

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